



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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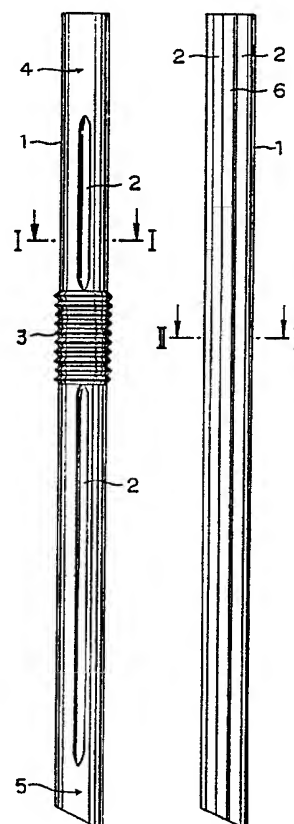
Published

*With international search report.*

(54) Title: STRAW

## (57) Abstract

This invention relates to a straw made of synthetic resin of normal round tube shape in which air passing through hole capable of introducing exterior air is formed at a place perforated by said straw so that phenomenon becoming to vacuum within the interior of container is prevented. The invention is constructed in such a manner that at least one or more lengthwise groove(s) (2) for producing exterior air introducing hole or protuberance(s) (6a, 6b) are formed along the lengthwise direction of a straw (1) except top end portion (4) and bottom end portion (5) in case of the groove(s) (2). According to the invention, since exterior air introducing hole is produced at a place perforated by the straw simultaneously upon inserting with it, content within a container such as carton pack is conveniently sucked without such phenomenon becoming to vacuum of carton pack.



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## SPECIFICATION

TITLE

Straw.

TECHNICAL FIELD

5       The present invention relates to an improvement  
of synthetic resin made straw formed as round slender  
bamboo tube, and more particularly to a straw in  
which air passing flow channel is formed that  
exterior air can be introduced through a place per-  
10   forated by the straw so that phenomenon becoming to  
vacuum within the container is prevented.

BACKGROUND ART

Conventional synthetic resin made sucking pipe  
formed as round slender bamboo tube shape, that is,  
15   straw is substantially circular shape in cross  
section, and since edge of hole perforated by a  
straw abuts external circumferential surface of the  
straw, even if the hole of straw is perforated,  
flowing in of exterior air is hard to be introduced  
20   into the container.

Consequently, the phenomenon becoming to vacuum of container according to the flowing out of contained material is unavoidable, and therefore not only difficulty becomes arisen for sucking the  
5 containing material, but also in case of carton pack, it becomes contracted or getting dented in.

#### DISCLOSURE OF INVENTION

Inventor of this application thought that aforementioned phenomenon has problem finally at its  
10 structure of the straw and as a result that he studied carefully, he has come to see a completion of straw in which, in a container for packaging liquid material capable of perforating a hole for straw, in case when a hole is perforated by the straw, open gap that the  
15 straw does not abut to a part of edge of said hole is remained and thereby exterior air is made to be flowed in through this gap so that phenomenon becomes in to vacuum within interior of container according to the flowing out of liquid contents is prevented  
20 and thereby it is made to be easy to suck the liquid contents.

At least one or more concave grooves are formed along with its lengthwise direction to the straw according to the present invention. Said concave groove is called as longitudinal groove in the present invention, and these longitudinal grooves may  
5 either be formed throughout the whole length of the straw, or they may be formed partially. Wherein, " partially " means to form longitudinal groove as aforementioned without making it up to  
10 a predetermined height from the tip end of the straw.

The straw according to the present invention has advantage that, in case of sucking the liquid drink and the like contained within a container such as carton pack, exterior air is smoothly and naturally  
15 flowed in through the gap perforated by the straw so that phenomenon becoming to vacuum within interior of container is prevented, and according to this, beverage and the like contained within container can be sucked conveniently without any difficulty.

20 The forgoing and other objects as well as advantages of the present invention will become clear by following description of the invention with reference

to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the invention, and to show how the same may be carried out into effect, reference will now be made, by way of example, with  
5 respect to the accompanying drawings, in which :

FIG. 1 is a front elevational view of a straw according to a preferred embodiment of the present invention,

10 FIG. 2 is a front elevational view of a straw according to another preferred embodiment of the present invention,

FIGS. 3 and 4 are cross sectional views taken along line I-I and II-II of FIG. 1 and FIG. 2  
15 respectively.

FIGS. 5(A)(B), 6 and 9 are cross sectional views and fragmentary perspective views respectively for showing another preferred embodiment of the present invention,

20 FIG. 7 is a diagram for showing a place perforated by a straw shown in FIG. 6, and

FIG. 8 is a longitudinal cross sectional view of FIG. 7.

Throughout the drawings, like reference numerals and symbols are used for designating like or  
5 equivalent parts or portions, for simplicity of illustration and explanation.

BEST MODE OF CARRING OUT OF THE INVENTION

Hereinafter, the preferred embodiments of the present invention will be described more in detail  
10 with reference to the accompanying drawings.

According to the first embodiment of the present invention, as shown in FIGS. 1 and 3, in a straw 1 having creases 3 capable of bending to any direction on appropriate longitudinal portion, at least one  
15 straight lengthwise groove(s) 2 are formed along the lengthwise direction of the straw on lower side of said creases 3 or both of lower and upper sides of the creases of the straw. Said lengthwise groove 2 is pitted in concave toward internal center axis  
20 of the straw 1, and thus pitted vacant space becomes to meet a function of passing hole capable of passing

exterior air into the container in case when a hole is perforated by a straw to a container such as carton pack thereafter.

And, the lengthwise grooves 2 are not formed at the top end 4 and bottom end 5 of said straw 1 and still remained as they are round states. This is because worry about both cases is considered that concomitant effect which may be happened in case when above described lengthwise grooves 2 are formed up to both of top and bottom ends 4, 5, that is, a case where exterior air is sucked together into mouth when the top end 4 is held by mouth and sucked so that difficulty for sucking the content can be occurred, and a case where the bottom end 5 may not be formed with air flowing in path as lengthwise groove 2 at a place which is perforated by the straw when it is inserted to a carton pack. In case of a straw formed with lengthwise groove 2 to the bottom end 5, path capable of flowing in the exterior air is not provided until when the lengthwise groove 2 is turned to either rotational direction of right or left after perforating so as not to be filled up around periphery of hole perforated by the surface of lengthwise groove the straw 1,



and therefore in order to reduce the effort for turning the straw after perforating, it is desirable not to form the lengthwise groove 2 at the bottom end 5.

5        On the other hand, in the second embodiment, as shown in FIGS. 2 and 4, two lengthwise grooves 2 are formed at both sides of protuberance 6a having a predetermined width along the lengthwise direction of the straw 1.        However, in spite of such variation of embodiment, it does not make any change for  
10        accomplishing the object sought by the present invention.

      According to some other embodiments, as shown in FIGS. 5(A), (B), they are similar as previously  
15        described embodiments except that the grooves 2 or similar grooves of lengthwise direction having same object with these are formed in plurality numbers. And, in the another embodiment shown in FIG. 6, a protuberance 6b of triangular shape is formed only  
20        at the tip end of the bottom of straw 1, and FIG. 9 is an example of variation of aforementioned second embodiment, a protuberance 6c is formed in long with smoothly curved cross section.        In any case, it

is same that hole H capable of flowing with exterior  
air is remained at the perforated place. In case  
when such protuberance 6c is formed through whole  
length except the cases forming the lengthwise  
5 groove 2 or protuberance 6b at a part of the straw  
1 as shown in FIGS. 1 and 6, holes for air flowing  
by the protuberance 6a, 6c are formed only when the  
straw is turned appropriately to one of either  
rotational direction of right or left after per-  
10 forating a carton pack.

In the drawings symbol letter A presents per-  
forated place, and P represents wall of pack.

As described above, according to the straw of  
the present invention, since path capable of flowing  
15 with exterior air is provided simultaneously at a  
place perforated by the straw, in case when sucking  
the content contained within a packed container  
such as carton pack, phenomenon becoming to vacuum  
within the interior of container is prevented and  
20 it can be conveniently sucked.

It will be appreciated that the present invention is not restricted to the particular embodiment that has been described hereinbefore, and that variations and modifications may be made therein without departing from the spirit and scope of the invention as defined in the appended claims and equivalents thereof.

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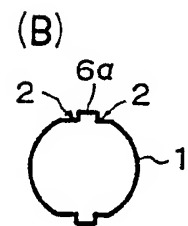
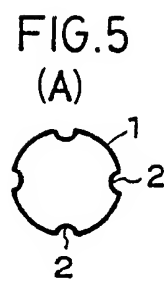
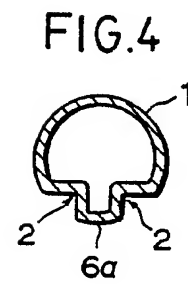
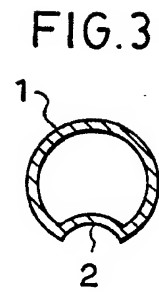
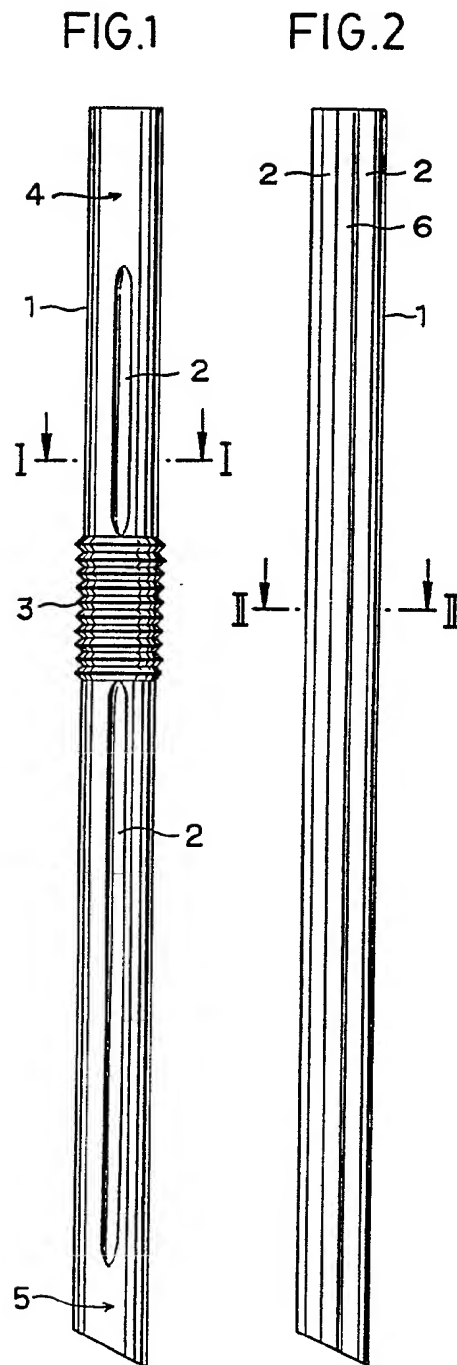
CLAIM

1. In a normal straw 1 or 1a made of synthetic  
resin, a straw having at least one or more length-  
wise groove(s) 2 or protuberance(s) 6a, 6b for  
5 flowing in exterior air along the lengthwise  
direction of the straw.

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2/2

FIG.6

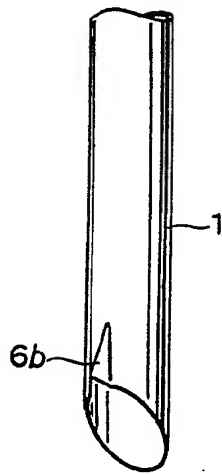


FIG.7

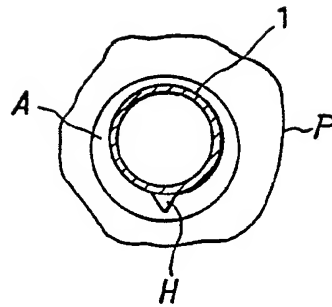


FIG.8

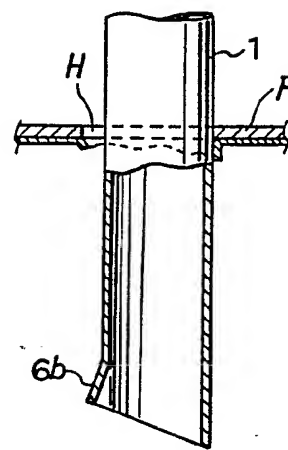
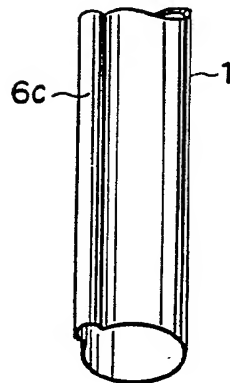


FIG.9



# INTERNATIONAL SEARCH REPORT

International Application No PCT/KR 91/00003

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup> According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl. <sup>5</sup> : A 47 G 21/18										
<b>II. FIELDS SEARCHED</b> <div style="text-align: right; margin-right: 100px;">Minimum Documentation Searched <sup>7</sup></div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border-bottom: 1px solid black; padding: 5px;">Classification System</td> <td style="border-bottom: 1px solid black; padding: 5px;">Classification Symbols</td> </tr> <tr> <td style="border: 1px solid black; padding: 10px;">Int.Cl.<sup>5</sup></td> <td style="border: 1px solid black; padding: 10px;">A 47 G 21/18</td> </tr> </table> <div style="text-align: center; margin-top: 10px;">           Documentation Searched other than Minimum Documentation            to the Extent that such Documents are Included in the Fields Searched <sup>8</sup> </div>			Classification System	Classification Symbols	Int.Cl. <sup>5</sup>	A 47 G 21/18				
Classification System	Classification Symbols									
Int.Cl. <sup>5</sup>	A 47 G 21/18									
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>9</sup></b> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%; border-bottom: 1px solid black; padding: 5px;">Category <sup>9</sup></th> <th style="width: 60%; border-bottom: 1px solid black; padding: 5px;">Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup></th> <th style="width: 30%; border-bottom: 1px solid black; padding: 5px;">Relevant to Claim No. <sup>13</sup></th> </tr> <tr> <td style="border: 1px solid black; vertical-align: top; padding: 10px; text-align: center;">X</td> <td style="border: 1px solid black; vertical-align: top; padding: 10px;">           DE, A1, 2 713 699 (UNILEVER) 13 October 1977            (13.10.77), see totality.   <div style="text-align: center;">-----</div> </td> <td style="border: 1px solid black; vertical-align: top; padding: 10px; text-align: center;">(1)</td> </tr> </table>			Category <sup>9</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>	X	DE, A1, 2 713 699 (UNILEVER) 13 October 1977 (13.10.77), see totality.  <div style="text-align: center;">-----</div>	(1)		
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<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top; padding: 5px;"> <sup>10</sup> Special categories of cited documents:            "A" document defining the general state of the art which is not considered to be of particular relevance            "E" earlier document but published on or after the international filing date            "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)            "O" document referring to an oral disclosure, use, exhibition or other means            "P" document published prior to the international filing date but later than the priority date claimed         </td> <td style="width: 50%; vertical-align: top; padding: 5px;">           "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention            "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step            "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.            "&amp;" document member of the same patent family         </td> </tr> </table>			<sup>10</sup> Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family						
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<b>IV. CERTIFICATION</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;">Date of the Actual Completion of the International Search</td> <td style="width: 50%; border-bottom: 1px solid black; padding: 5px;">Date of Mailing of this International Search Report</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px;">30 April 1991 (30.04.91)</td> <td style="border-bottom: 1px solid black; padding: 5px;">17 May 1991 (17.05.91)</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 5px;">International Searching Authority</td> <td style="border-bottom: 1px solid black; padding: 5px;">Signature of Authorized Officer</td> </tr> <tr> <td style="padding: 5px;">AUSTRIAN PATENT OFFICE</td> <td style="padding: 5px; text-align: center;"> </td> </tr> </table>			Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	30 April 1991 (30.04.91)	17 May 1991 (17.05.91)	International Searching Authority	Signature of Authorized Officer	AUSTRIAN PATENT OFFICE	
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Anhang zum internationalen Recherchenbericht über die internationale Patentanmeldung Nr.

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentedokumente angegeben. Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

Annex to the International Search Report on International Patent Application No. PCT/KR 91/00003

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned International search report. The Austrian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Annexe au rapport de recherche internationale relatif à la demande de brevet international n°.

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Im Recherchenbericht angeführtes Patent- dokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
DE-A1- 2713699	13-10-77	BE-A1- 853182 DE-U1- 7709763 FI-A - 770971 FR-A1- 2345972 FR-B3- 2345972 NL-A - 7703560 SE-A - 7603954	03-10-77 19-04-79 03-10-77 28-10-77 11-01-80 04-10-77 03-10-77